BIOC 447/547 – Biology and the Future of Medicine
Spring 2016 Syllabus

Time and location

Tuesday and Thursday 10:50 am-12:05pm, GRBH W211

Instructors (office hours by appointment)

Dr. Daniel Wagner dswagner@rice.edu
Dr. Kirstin Matthews krwm@rice.edu

Teaching Assistant Fabio H. Brasil C. fb14@rice.edu

Course objectives

The goal of the course is to provide an in-depth understanding of advanced topics in biology and their potential impact on medical practice. We will critically examine the development and current state of genome sequencing and stem cell technologies and evaluate their potential for improving human health care. Students will be expected to read and critically evaluate primary and secondary sources and provide clear summaries of their findings.

Primary literature

Substantial reading of research articles from the primary literature is required. PDFs of assigned papers will be provided in the Resources folder of the course OwlSpace site or you will have to download them from the journals' web sites. For presentations and paper projects for this course, students will need to conduct extensive independent research in the primary literature.

Attendance and participation

Attendance at every class session is mandatory. Students must arrive promptly in time for the beginning of class and stay for the entire class period. Active participation in every class period is expected.

Grading

80% of the course grade will be based 2 papers and 2 in class presentations, 5% will be based on class participation, 10% on quiz grades and 5% will be based on attendance of appropriate seminars during the semester.

Quizzes

Quizzes on material to be presented in class will be posted on Owlspace about a day before class. Quizzes should be completed before class.

Presentations

Your group of 4 will give 2 - 25 minute presentations, one in each half of the course. Each student will address different aspects of topics important to the class. In general one will be responsible for an introduction to the topic, and the other three for presentation of the underlying technology and an evaluation of the risks and benefits of implementation of the technology as appropriate. A list of appropriate topics will be provided. You should feel free to come up with another topic but you must have it cleared with Dr Wagner and Dr Matthews.

Your group will meet with Dr Wagner and/or Dr Matthews at least one week before your scheduled presentation. At this meeting you should have an outline of your presentation, a suggested reading for the class and 3-4 questions for the class based on the reading. We encourage students to consult the CWOVC website (http://cwovc.rice.edu/resourcesg) and make use of their presentation coaching and slide design advice.

Papers

The papers will be a more in-depth treatment of the subject presented in class. Length should be approximately 10 pages single spaced, Times New Roman 12 pt font, 1.5 inch margins. Each group must turn in one cohesive paper, but each student is responsible for his/her own section(s) within that paper and it must be appropriately labeled. Please pay attention when linking the sections together to make sure ideas are not repeated, concepts are introduced before discussed and the sections flow well from one author to the other.

Research sources should be from the peer reviewed literature whenever possible. All sources should be clearly documented and properly cited. Use a consistent citation style, preferable the Chicago manual of style and Author Date in text citations http://www.chicagomanualofstyle.org/tools_citationguide.html. We encourage students to consult the CWOVC website (http://cwovc.rice.edu/academicwriting) and make use of their facilities. This means you'll have to start writing early so don't wait!

Seminars

The University and institutions in the TMC host many seminars on topics appropriate to this course. You should attend 3 during the semester.

BIOC 447 students should attend the lecture and then write an approximately 250 word summary of the presentation. The summary should include the major questions addressed in the presentation and the conclusions reached. In the case of research presentations a summary of the methods used should also be included.

BIOC547 students should attend the lecture and then write a 2-page (single spaced, Times New Roman 12 pt font, 1.5 inch margins) critical analysis of the presentation. The analysis should include the major questions addressed in the presentation and the conclusions reached. The presentation should be placed in a larger context of research and reference published work by the presenter and the work of other researchers when appropriate. We expect a minimum of 3 references for each critique.

Appropriate seminars include:

- Baker Institute
  - http://bakerinstitute.org/events/search/
- Departmental seminars featuring invited speakers in research departments at Rice
  - http://biosciences.rice.edu/EventsList.aspx?t=183
  - http://bioe.rice.edu/EventsList.aspx

Accommodations for students with disabilities

Any student with a documented disability needing academic adjustments or accommodations is requested to speak with the instructor during the first two weeks of class. All discussions will remain confidential. Students with disabilities also should contact Disability Support Services in Allen Center.

Textbook

This course will primarily focus on evaluation of primary sources. No text book is required for this course but we encourage extensive background reading to prepare for specific topics.
Suggested sources include:

- Alberts et al., *Molecular Biology of the Cell*
- Drawing The Map Of Life: Inside The Human Genome Project
- Stem Cells Scientific Facts and Fiction

Papers for upcoming lectures:

- 14 Jan: "Bioethics" – Guest Lecturer Dr. Ana Iltis
  - http://jama.jamanetwork.com/article.aspx?articleid=192740&resultClick=3
- 19 Jan: "Clinical Trials: How do we protect the public?" – Matthews
  - http://www.nature.com/nbt/journal/v30/n1/full/nbt.2083.html
  - http://www.nejm.org/doi/pdf/10.1056/NEJMra1010517